



training  
systems  
for the  
1990s

a company  
introduction



**REDIFFUSION**  
**SIMULATION**

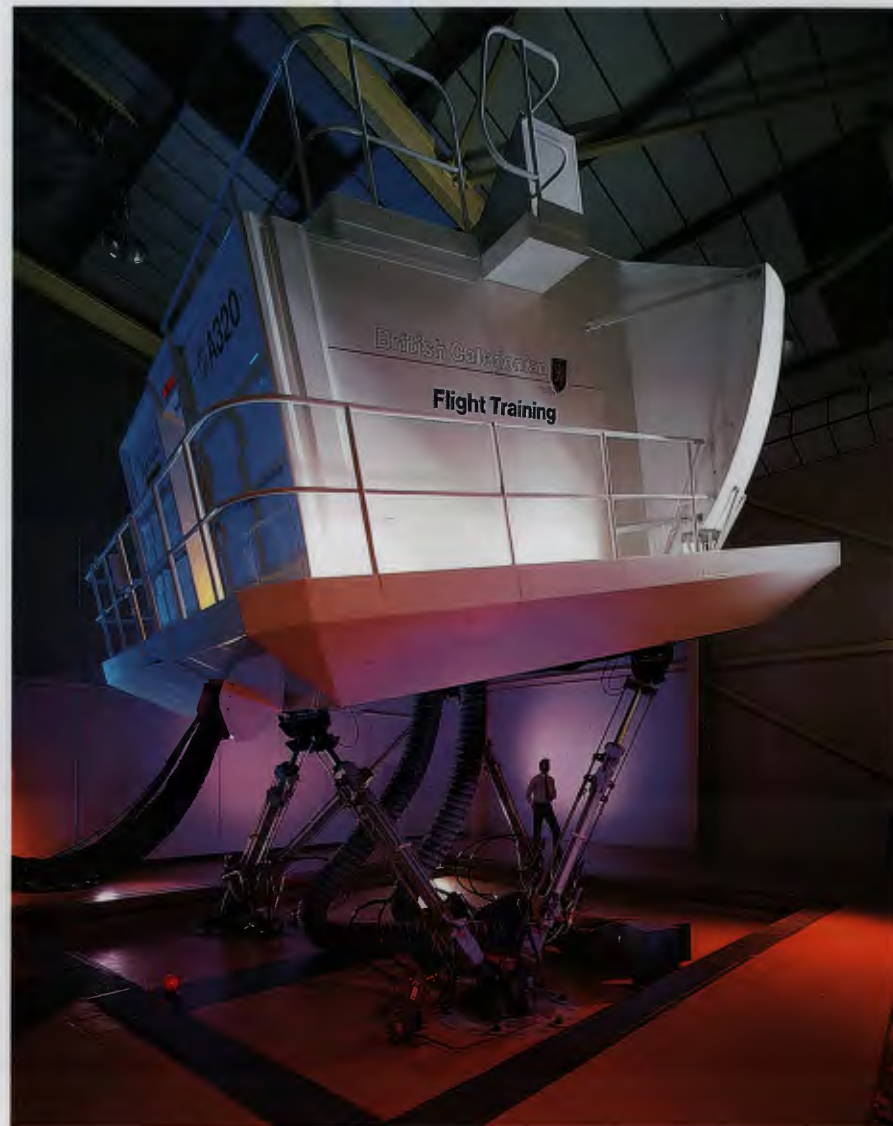
A GM Hughes Electronics Company



WHATEVER YOUR TRAINING NEED, REDIFFUSION SIMULATION HAS THE ANSWER. AND THAT ANSWER COMES NOT ONLY FROM REDIFFUSION'S UNMATCHED 40 YEARS OF EXPERIENCE IN THE TRAINING AND SIMULATION INDUSTRY, BUT ALSO FROM A

As a proud and important member of that team, Rediffusion's mainstream business remains the development and production of advanced technology simulators, visual systems and training aids for all flight training applications. We are also in the business of providing training

## A NEW FORCE IN TRAINING



Full Flight Simulator for the Airbus A320 – the world's first fully fly-by-wire commercial airliner



Rediffusion is committed to achieving the highest standards of engineering quality

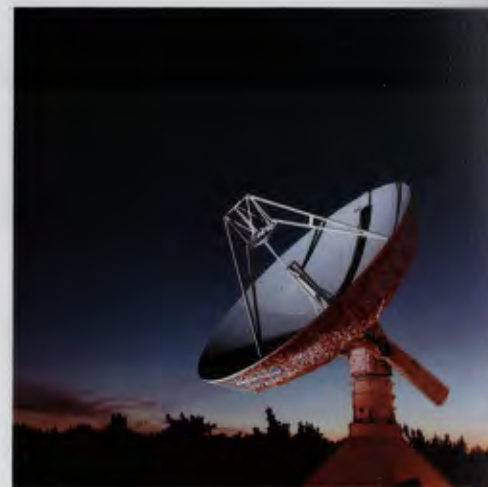
NEW AND EXCITING LIAISON WITH ONE OF THE LARGEST, MOST RESPECTED ELECTRONICS COMPANIES IN THE WORLD.

Today, Rediffusion is part of Hughes Aircraft Company, one of the United States' largest electronics companies, itself a subsidiary of GM Hughes Electronics Corporation. Hughes is organised on a decentralised basis where minimum central controls weld together a number of individual Groups, each specialising in a particular field and each allowed to operate as a strong, self-sustaining industrial team.

Totally committed to investment and growth in the training and simulation industry, Hughes has recently forged a new Group – Training and Support Systems.

Rediffusion is a key player within that organisation which brings together Hughes training activities, such as production of the US Navy's F/A-18 Weapons Tactics Trainer, with worldwide support of Hughes' products in the field.

▼ Hughes is a world leader in radar and communications



systems for other defence and industrial applications.

Our customers demand the highest standards of realism and training effectiveness to meet their individual requirements, and Rediffusion is committed to maintaining its technological superiority in order to meet those needs.

But Rediffusion knows that staying at the forefront of technology provides only part of the answer. In order to satisfy customer demand, it must also provide affordable training solutions which can be delivered quickly with maximum life-cycle cost benefits. The company believes its unique position, backed by the strength of Hughes, allows it to do this. Only Rediffusion can offer total training packages, from full flight simulators to small part-task trainers, with all the expertise and support that comes from 40 years' specialised knowledge of the industry.

Rediffusion's headquarters and main production plants are based near London's Gatwick Airport in southern England. It also maintains smaller facilities at Aylesbury, Brighton, Burgess Hill and Medway in the UK. The company currently employs some 2,500 people.

▼ Rediffusion has provided Hawk simulators to a number of defence authorities



◀ The first 747-400 simulators into airline service were supplied to Cathay Pacific and British Airways



▲ Rediffusion simulators are used in Lufthansa's revolutionary Futura programme for ab initio pilots



▲ Hughes F/A-18 Weapons Tactics Trainer

### HUGHES



General Motors' record breaking Sunraycer solar powered car



IN ANY BUSINESS, THE PRODUCT ITSELF REPRESENTS ONLY HALF THE SUCCESS STORY. CUSTOMER SERVICE AND SUPPORT COMPLETES THE PICTURE. OUR EMPHASIS HAS ALWAYS BEEN ON TOTAL SUPPORT – MAKING REDIFFUSION AN EASY AND EFFICIENT

environment – with unrivalled expertise, and above all, commitment.

Developing flight simulator products to today's standards, where the training they give is more effective than in the aircraft itself, is ample evidence of the motivation of the work force.

## TOTAL TRAINING



Rediffusion has led industry ▲ with advanced touch-screen instructional systems

Spares and customer support are major priorities ▶



### COMPANY WITH WHICH TO DO BUSINESS.

Our dedicated spares and product training facilities form part of an integrated customer support package, providing 24-hour service throughout the world.

And it bears testimony to both the integrity of our products and their effectiveness, that Rediffusion flight simulators regularly achieve 99% availability over 20 hours a day, 7 days a week.

We are proud of our position as a world leader in this exciting, and demanding business. We face the challenges of the future – maintaining our market superiority, developing and expanding our product range to the highest standards of technical excellence, and supporting our customers in a truly integrated training

Purpose-built facilities now support the visuals and trainer units ▼



## TOTAL SUPPORT

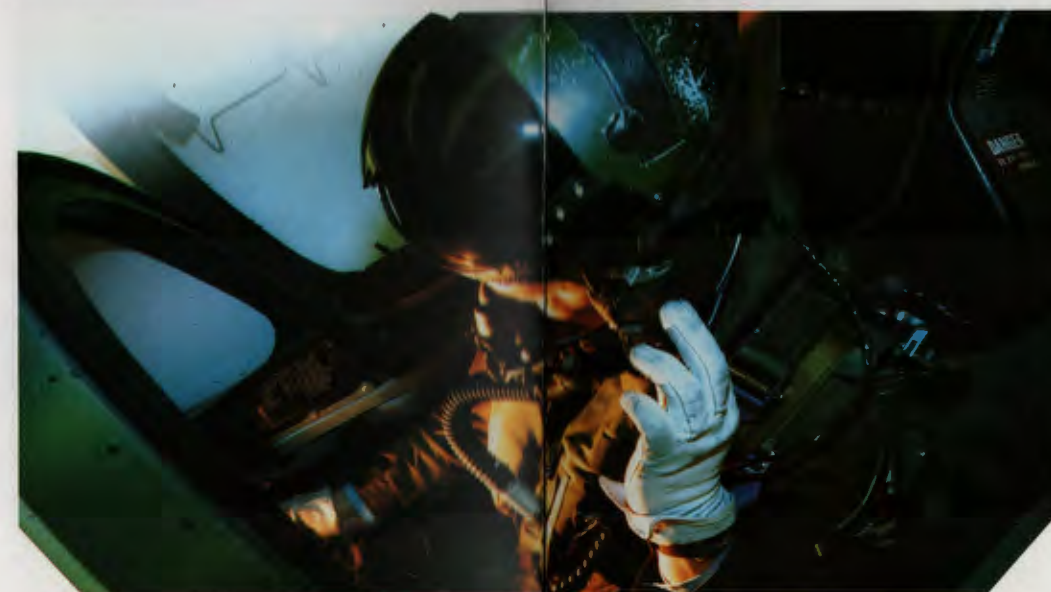
And this extends across the board. Our investment in research and development is ongoing, and at a level which allows us to maintain our technical leadership in all market sectors.

Our diversification into new market areas has endorsed the company's marketing philosophy – to supply integrated training which truly reflects the needs of our customers. In support of this philosophy, we established our Interactive Training Systems unit, which covers all training applications – industrial, commercial aerospace, military and other public sector organizations. Whether its just a feasibility study to look at the problems involved, or to design and implement a complete training system, Rediffusion has a wealth of experience to offer.

And these integrated training systems extend our product range into the classroom arena, with instructor aids, and audio-visual aids to give a truly integrated package.

Total integration of training has also been the key to our activities at the British Caledonian Flight Training Centre. Now operated in partnership with British Airways, it provides total training for more than 50 airline customers, predominantly those with a fleet size that cannot justify the acquisition of a flight simulator. Training centres like these relieve operators of the administrative costs and operational overheads of running their own training facilities, and are an important growth industry.

▲ A Rediffusion Hawk simulator in service with the Royal Air Force ▼



▶ Massive investment in R&D has ensured continued innovation in simulator and visual systems



▲ Interactive Training Systems covers a wide range of aerospace, defence and industrial applications



▲ Systems' procedures trainer maximises effectiveness of training for glass cockpit aircraft



AROUND THE WORLD, DEFENCE DEPARTMENTS ARE FACING TOUGH BUDGETARY DECISIONS WHICH DEMAND THAT THEY GET THE MOST COST-EFFECTIVE USE OUT OF EQUIPMENT AND PERSONNEL. PROPER USE OF TRAINING IS RECOGNISED AS THE BEST WAY

King. We are also supplying trainers to the Italian Air Force for its MB339 programme and a dome simulator to the Swiss Air Force for Hawk jet training.

Rediffusion is geared towards providing its military customers with a training system

## FRONT LINE OF MILITARY TECHNOLOGY



▲ Novoview SP-X 500 and dome display takes this Hawk simulator into the mission training arena



Computer-based classroom training ▲ systems for the Tornado

### OF ACHIEVING MAXIMUM BENEFITS FROM LIMITED RESOURCES.

Rediffusion understands the problems. It is a company with a long history of experience in the military training arena. It provided the first electronic navigation trainers and some of the first flight simulators for the early jet fighters of the 1950s and '60s.

For the US Air Force, Rediffusion has provided simulation equipment for the B-52, E-3A AWACS and B-1. For the UK Ministry of Defence, we have recently supplied trainers for the VC-10, Nimrod Maritime Reconnaissance aircraft, Tornado GR1 and F3, and the Royal Navy's Sea

World's most advanced helicopter simulator, for the RN Sea King ▼



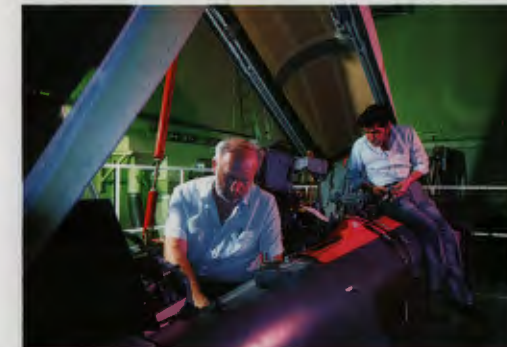
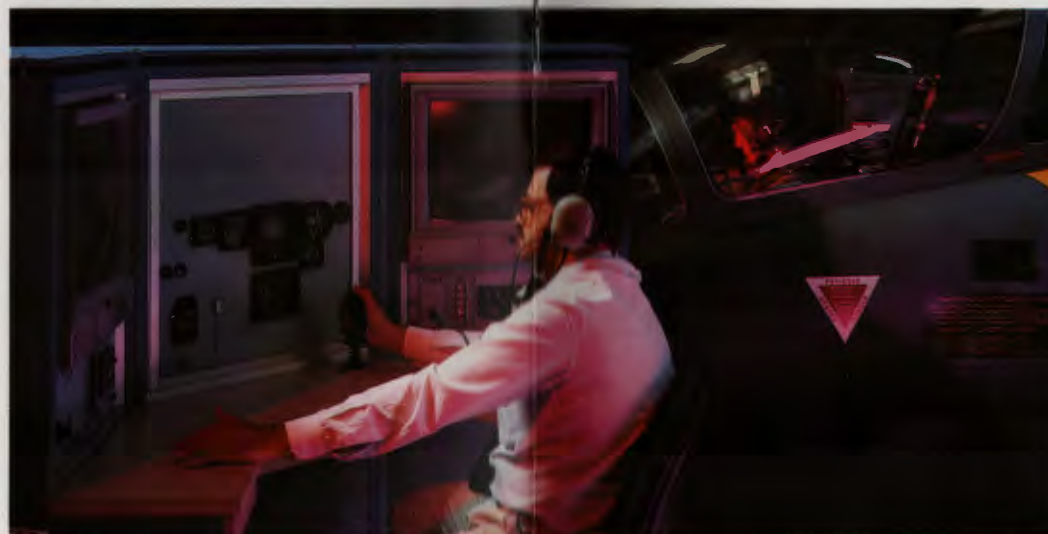
configuration which most closely meets their needs, in terms of cost and standards. Consequently, our product range offers flight and procedural trainers, classroom training aids and computer-based training devices as well as sophisticated full flight simulators.

Perhaps more significantly, Rediffusion can also help the customer determine what his training requirements are – an important factor in making sure that the best possible use is gained out of a new aircraft type. Years before the new European Fighter Aircraft is scheduled to enter service, Rediffusion is under contract to the Royal Air Force to perform a study analysis to help define the UK's national future training requirements.

Some of Rediffusion's most advanced developments have been aimed specifically at meeting the very exacting requirements of military training. Our WIDE display system, for instance, can provide a panoramic field-of-view extending up to 200 degrees horizontally. This is particularly important for helicopter training, and helps to make the RN's Sea King simulator the most advanced in the world.

In military simulation, visual cues are the critical elements in the move towards full mission capability. Feeding the pilot with faithful information, so that he can react swiftly and correctly, is now a skill at the forefront of technology. Rediffusion is leading this move in all aspects of simulation and is developing the technologies which will enhance the realism of military training.

Advanced trainer, built at Rediffusion's Aylesbury ▼ plant, for the Italian Air Force's MB 339



◀ Rediffusion's flight station under construction for the Tornado mission simulator

Advances in image generation technology produce detailed combat ▼ and tactical visual models



▲ Night vision simulation is becoming an increasingly important operational requirement



▲ Rediffusion's ITS unit at Burgess Hill is carrying out a training analysis for the EFA programme for the RAF



IT IS ALMOST 40 YEARS SINCE REDIFFUSION BUILT EUROPE'S FIRST FULLY ELECTRONIC SIMULATOR, FOR THE BOEING STRATOCRUISER. SINCE THOSE EARLY DAYS, WE HAVE CONTINUED TO ACHIEVE BREAKTHROUGHS IN FLIGHT SIMULATOR TECHNOLOGY, ALWAYS

conceptually responsible for its architecture, providing a progressively powerful solution to today's simulation needs.

Rediffusion's Touch Activated Simulator Control - TASC - instructor system is another innovation which has changed the way in which airlines

## LEADERS IN COMMERCIAL TRAINING



Flight deck of an A320 Full Flight Simulator ▲

Novoview SP-X visual simulation systems have dominated the airline market ▼



AHEAD IN NEW DEVELOPMENTS - FROM THE FIRST COMMERCIAL JETS TO CONCORDE AND TODAY'S MOST ADVANCED FLY-BY-WIRE AIRLINERS.

Such is the sophistication of flight training technology today that, under international regulatory certification, all pilot conversion training and recurrent checks can be transferred from the aircraft to the simulator. This leads to substantial improvements in flight safety as well as significant savings in cost.

As a direct result, Rediffusion has captured a dominant share of the world's commercial airline training market, and is providing simulation equipment for all current generation aircraft types, including the latest variants of Boeing 737, 747, 757 and 767; McDonnell Douglas MD-11, MD-80 and MD-82; Airbus A300, A310 and A320; and British Aerospace BAe 146.

Rediffusion's teams of dedicated engineers and scientists work at the very forefront of technology to ensure that the crews of such aircraft can be trained to the most exacting of standards. That calls for a combination of simulation technologies: Accurate and fluid motion cues; realistic visuals; faithful reproduction of the aircraft's noises and instrumentation panels; and a fully integrated instructor console which allows flexible teaching and maximum feedback.

All of these techniques have been made possible by the implementation - and continuous improvement - of computing technology, which is at the heart of every simulator.

Distributed processing is today's solution, and Rediffusion was not only the first manufacturer to apply the technique, but was also

view training. TASC, which combines touch-screen computer graphics with microprocessor control, decreases the instructor's workload, allows greater interaction with the crew, and has thus set industry standards.

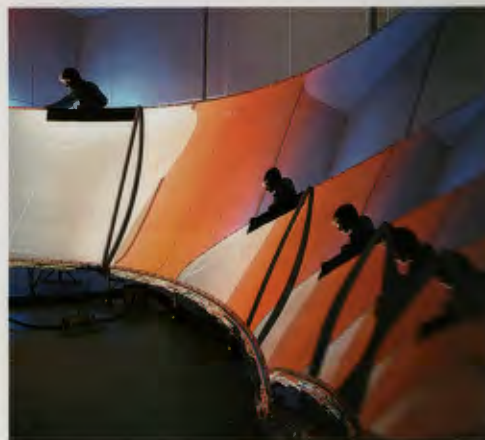
In the area of visual simulation, our range of Novoview image generation systems, configured around the Evans & Sutherland\* ESIG range of image generators, has established us firmly as market leaders. From basic night-dusk systems to full daylight systems with many added enhancements, Rediffusion can supply whatever level of visual system is required. Our top-of-the-range SP-X systems bring a level of realism to training previously thought impossible. At the other end of the spectrum, and new to Rediffusion's range of visual systems, is the Novoview Low Cost Visual (LCV) system, which provides cost-effective visual cues consistent with the needs of small simulators and trainers.

In display technology, Rediffusion's WIDE system has now been in service for almost ten years. Now an industry standard, no other manufacturer has been able to gain on the massive lead in technology which enabled Rediffusion to develop and introduce this projector-based system to the training environment and give pilots a continuous, uninterrupted field-of-view.

Innovations such as these have gained Rediffusion the reputation of not only understanding the needs of commercial aviation training, and supporting them around-the-clock, but also of continuously striving to improve the training environment.

\* Rediffusion Simulation holds exclusive rights to Evans & Sutherland image generator products in the world civil, and UK military flight simulator markets.

Mirror production for Rediffusion's SupraWIDE display system ▼



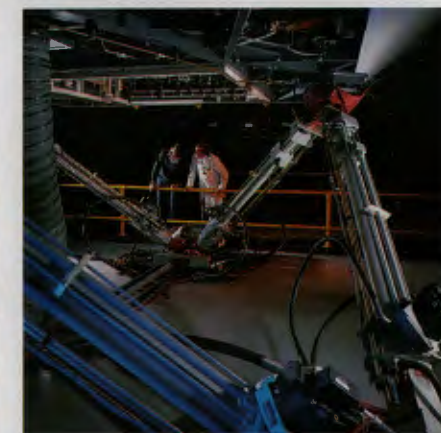
SupraWIDE projectors are the only production units capable of calligraphic light display ▼



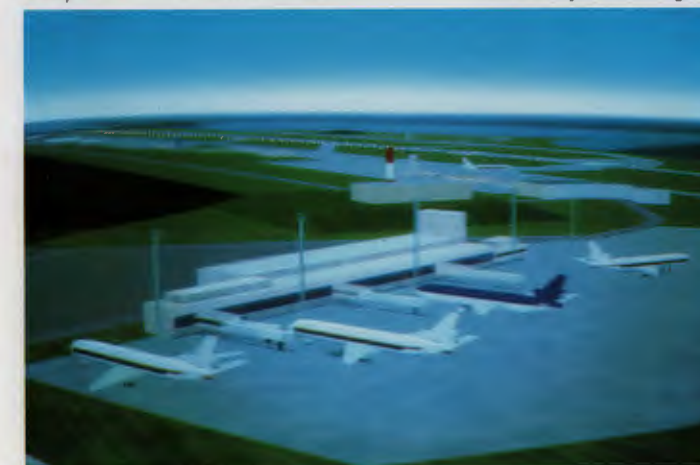
British Airways Concorde simulator, which has been fully updated by Rediffusion to provide training into the next century



Boeing 747-400 simulator in factory acceptance with Air New Zealand



Rediffusion simulators achieve 99% availability for training



SP-X Daylight visual simulation extends training capability to Phase III and beyond



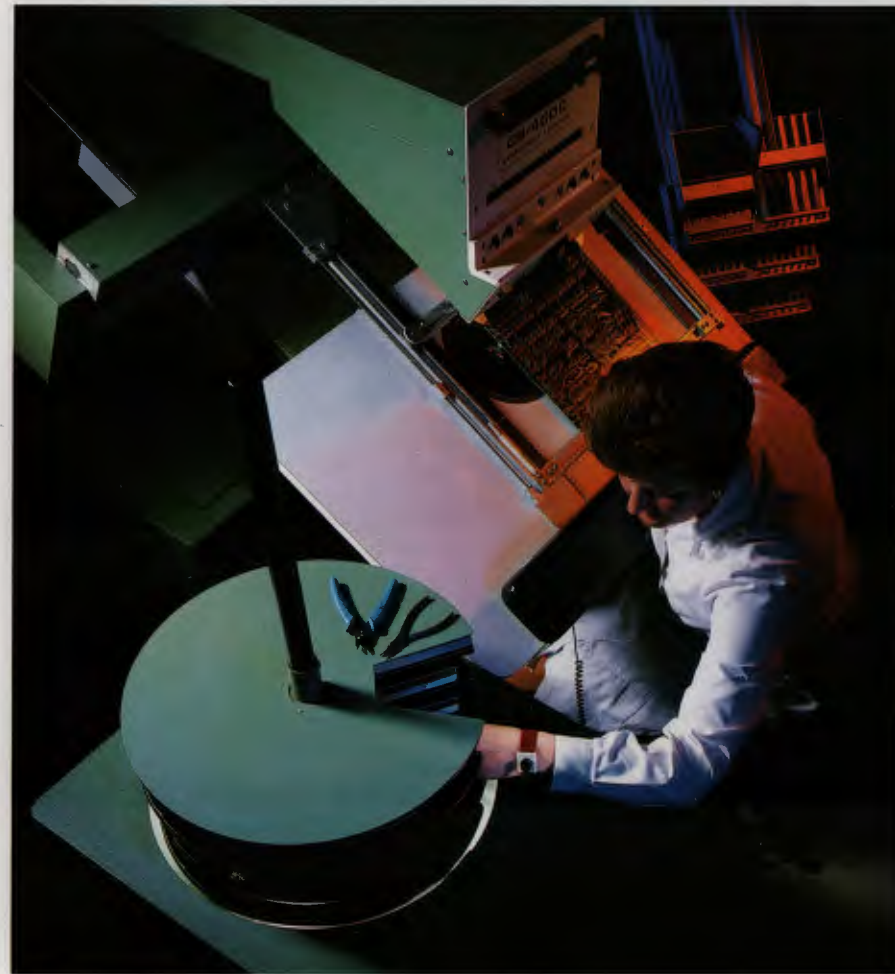
AT THE END OF THE DAY, ANY SUCCESSFUL BUSINESS IS ABOUT THE PEOPLE IT EMPLOYS AND THEIR COMMITMENT TO THEIR INDUSTRY.

Rediffusion is investing heavily in its people, its production resources and in new facilities to meet the growing demands of the 1990s. Its

► Capacity essential to meet tomorrow's training needs.

A six-bay extension has been completed at Tulsa in the USA which will allow the assembly of hardware and software modules built at Rediffusion's main Crawley plant. The

## I N V E S T M E N T F O R T H E 1 9 9 0 s



PCB manufacture at the ▲ Brighton factory



▲ Advanced numerically controlled machine tools enhance production accuracy and speed ►

Crawley headquarters has seen production capacity increase by almost 40% in the past three years – but expansion does not end there.

As part of a long-term growth strategy, fully supported by Hughes Aircraft Company, Rediffusion has embarked on a number of new ventures which will bring on-stream additional



▲ Visual systems' business has its own purpose-built facilities ▼



Simulators initially will be for smaller jet and prop transport aircraft. Also in the United States, Rediffusion has recently established 'on-shore' customer support facilities to address all the needs of its customers in this very important part of the commercial market.

Rediffusion has also established a new expansion base in Glenrothes, Scotland, which will be an important systems' engineering facility for future growth. More than £1 million has been invested in Glenrothes, which increases our capability to write the computer programs that allow the simulator to represent the precise flying characteristics of the aircraft.

And investment continues, of course, at our main plants: new buildings, new production machines, new computer facilities. All support our people as they strive to keep Rediffusion ahead of its field through the next decade.

Staying ahead is a position with which we are familiar, and which has gained us five Queen's Awards, and the Duke of Edinburgh's personal prize for the most outstanding achievement in British Industrial design.

Rediffusion believes that understanding the changing needs of its customers is a vital ingredient in maintaining that position. Our customers demand total training solutions at realistic prices. Here at Rediffusion Simulation, we believe we have the understanding, expertise and experience to respond.



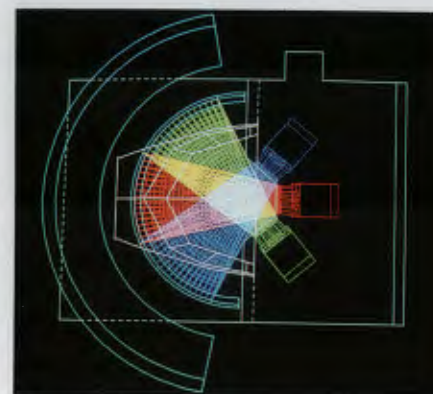
◀ In-house computing tools are an important part of design and production



▲ Precision and quality are key issues



▲ WIDE mirror manufacture at Medway facility



▲ Computer Aided Design improves production schedules





**REDIFFUSION  
SIMULATION**

A GM Hughes Electronics Company

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